

### **REMARKS/ARGUMENTS**

Claims 1, 2, and 4–18 are pending in the above-captioned application. Of these, claims 1, 2, and 4 are allowed. Claims 5, 10, 11, and 17 stand rejected. Claims 6–9, 12–16, and 18 are objected to as being dependent upon a rejected base claim.

#### **I. Claim rejections under 35 U.S.C. § 102**

Claims 5, 10, 11, and 17 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Johnson et al. (WO 97/2357). This rejection is respectfully traversed. “[F]or anticipation under 35 U.S.C. § 102, a single reference must teach every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught must be inherently present.” MPEP § 706.02. “The identical invention must be shown in as complete detail as is contained in the . . . claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, USPQ2d 1913, 1920 (Fed. Cir. 1989).

With respect to claim 5, Johnson et al. do not teach “inducing a perturbation in a flow through a microfluidic channel of a microfluidic network,” nor do they teach “determining a characteristic of the flow or microfluidic network by monitoring progress of the perturbation.”

The Examiner cites Johnson et al. page 4, lines 28–36 through page 5, lines 1–31 as disclosing a microfluidic device having means for inducing a perturbation in a flow through a microfluidic channel. Applicants respectfully disagree with this interpretation of the cited text.

The cited text describes a miniature fluidic system having a first reaction chamber connected to a second reaction chamber by a fluid passage. The fluidic system includes a differential pressure delivery system for either forcing or drawing a liquid sample from the first chamber into the second chamber. The differential pressure delivery system of Johnson et al. thus induces flow, but Johnson et al. provide no teaching regarding inducing a perturbation in this flow. In fact, the term “perturbation” is not used by Johnson et al. anywhere in the text.

*Merriam-Webster’s Online Dictionary, 10th Edition*, defines “perturbation” as “a disturbance of motion, course, arrangement, or state of equilibrium.” Thus, to induce a perturbation in a flow, a fluid must be in motion prior to disturbing the flow of the fluid or the flow must be in a state of equilibrium. Johnson et al. do not teach disturbing an existing flow

between the first and second reaction chambers, nor do they teach the flow between the first and second reaction chambers as being in a state of equilibrium.

Applicants, by contrast, describe and claim, *inter alia*, a change in flow comprising a pulse of a detectable fluid being introduced into the flow (claim 6 and page 4, paragraph 0014) and a change in a material of the flow (claim 8 and page 22, paragraph 0104). Whether using *Merriam-Webster's Online Dictionary, 10th Edition*, or Applicant's specification to define the term "perturbation," it is clear that Johnson et al. do not disclose means for inducing a perturbation and, more important because Applicants' claim 5 is a method claim, Johnson et al. do not teach "inducing a perturbation in a flow through a microfluidic channel." As Johnson et al. do not teach inducing a perturbation, they cannot then teach "determining a characteristic of the flow or microfluidic network by monitoring progress of the perturbation."

Thus, Johnson et al. do not teach every aspect of the claimed invention either explicitly or impliedly, nor do they show the identical invention claimed by Applicants in as complete detail as is contained in independent claim 5. Withdrawal of the rejection of claim 5 under U.S.C. § 102(b) as being anticipated by Johnson et al. is, therefore, respectfully requested.

Claims 10 and 11 depend directly from claim 5. Therefore, Applicants respectfully submit that these claims are allowable for at least the same reasons as set forth herein with respect to claim 5. Withdrawal of the rejection of claims 6–16 under U.S.C. § 102 (b) as being anticipated by Johnson et al. is respectfully requested.

With respect to claim 17, at a minimum, Johnson et al. do not teach "a pressure transient generator ... for initiation of a flow perturbation." As shown above, the reference does not teach regarding a flow perturbation. Further, the reference is silent with regard to a pressure transient generator "in communication with a channel intersection of the microfluidic network."

The Examiner cites Figure 2B of Johnson et al. for this teaching. However, it does not appear to Applicants that the necessary elements are present in this figure. Figure 2B shows a schematic representation of one embodiment of a reaction chamber. Element 110 is identified on page 37, line 9, as a fluid channel. Element 108 is described on page 38, lines 9 and 10, as an opening within planar member 106. Element 126 is described on page 39, lines 2 and 3, as an opening within planar member 116. As Figure 2B shows only one channel (110), there can be no channel intersection in the embodiment shown.

Further, Figure 2b does not appear to illustrate a pressure transient generator. As the term is used by Applicants, a “pressure transient generator” generates a transient change in a flow, thus introducing a perturbation into the flow. This use of the term by Applicants is evidenced on page 29, paragraph 0123; page 30, paragraphs 0125 and 0126; and on page 31, paragraph 0128. By contrast, Johnson et al. show a structure that combines openings 108 and 126 with diaphragm valve 114 (identified on page 38, line 18) to prevent flow of a fluid through channel 110 into well 104 (identified on page 37, line 1).

Thus, Johnson et al. do not teach every aspect of the claimed invention either explicitly or impliedly, nor do they show the identical invention claimed by Applicants in as complete detail as is contained in independent claim 17. Withdrawal of the rejection of claim 17 under U.S.C. § 102(b) as being anticipated by Johnson et al. is, therefore, respectfully requested.

## II. Objections to claims

Claims 6–9, 12–16, and 18 were objected to as being dependent upon a rejected base claim. Claims 6–9 and 12–16 depend directly or indirectly from independent claim 5. Claim 18 depends directly from independent claim 17. Both claim 5 and claim 17 have been demonstrated above to be allowable over Johnson et al. (WO 97/2357). Therefore, the objection to claims 6–9, 12–16, and 18 must fall.

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Spaid, et al.

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**Conclusion**

For the foregoing reasons, Applicants believe all the pending claims are in condition for allowance and should be passed to issue. If the Examiner feels that a telephone conference would in any way expedite the prosecution of the application, please do not hesitate to call the undersigned attorney.

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Signed: \_\_\_\_\_

